ABSTRACT

In a Mach-Zehnder optical circuit that has a 3 dB coupler 10 whereby an NRZ light signal 53 inputted to an input port 7 is distributed to both arms of the circuit, a 3 dB coupler 3 whereby CW light 52 inputted to an input port 8 is distributed to both of the arms, and a 3 dB coupler 4 for synthesizing the light that has passed through both arms, the two arms of the circuit have nonlinear waveguide elements 1 and 2 whereby the refractive index is caused to change in nonlinear fashion and create a nonlinear shift in the phase of the inputted CW light when each NRZ signal distributed by the 3 dB coupler 10 is inputted, and further have variable attenuators 12 and 13 whereby the NRZ light signal inputted to the nonlinear waveguide element 2 is attenuated below the level of the NRZ light signal inputted to the nonlinear waveguide element 1. Furthermore, a variable delay circuit 11 is provided for causing the NRZ light signal to be inputted to the nonlinear waveguide element 2 after the NRZ light signal is inputted to the nonlinear waveguide element 1, and the time by which the input of the NRZ light signal is delayed by the variable delay circuit 11 is made shorter than the relaxation time of the change in the nonlinear refractive index in the nonlinear waveguide elements 1 and 2.